MERLIN ASSEMBLER (C) 1986 WIZARD SOFTWARE INSTRUCTION MANUAL

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MERLIN is a full 6502/7501/8501, two-pass assembler. The above MOS chips all use standard 6502 assembly code. **MERLIN** also has two extra registers which are located in zero page at locations $00 and $01. These are accessed from machine code like any other memory location.

MERLIN, once loaded, leaves BASIC intact. This allows you to enter your assembly language programs whilst still using the familar editing features of BASIC (e.g. AUTO, RENUMBER, DELETE, cursor editing, etc.). Saving, loading, and printing are all identical in operation to when you are using BASIC. You can also integrate assembly language and BASIC programs. However, all BASIC code must be after the '**END**' statement of the assembly code. BASIC code is executed using the **GOTO** command (*not **RUN***).

LOADING: Inset the disk and hold down the Commodore key and the Run/Stop key. The program will load in about 15 seconds. All normal BASIC commands (including **DIRECTORY**) work with **MERLIN**.

A green screen (used for eye comfort) and the 'READY' mesage will appear. Typing **ASM** and pressing the Return key will confirm a successful load.*NB the use of this program assumes a knowledge of 6502 machine code*.

MERLIN resides in memory from $1000 (4096) to $2100 (8449) and BASIC has been moved up to $2101 (8449) to allow for this. **MERLIN** will nto assemble in that part of memory ($1000-2100) and will warn as necessary. Beware when changing BASIC pointers and assembling near **MERLIN**.

To assemble your assembly language listing you should type **ASM** followed by the Return key whilst in edit mode. To execute the resultant code either use the **SYS** command from BASIC, or go into the machine code monitor and use the **G** command.

MERLIN COMMANDS

(1) COM xxxxx
Compile address - this must be placed on the first line of the assembly source-code program.

(2) LIST
The **LIST** command initiates the disassembly of what has just been assembled into memory. This means that you can see what has just been stored, and NOT what the assembler *thinks* has been stored into memory.

(3) STOP
The **STOP** command turns off disassembly as in **LIST**.

(4) END
The **END** command should always be placed as the last command in an assembly source code program as it informs **MERLIN** where to stop assembly from.

(5) LABELS: '.LABEL=xxxxx'
Labels can be used instead of actual addresses i.e. as above where **.LABEL** is set equal to an address. Labels can also be placed on a line by themselves to provide a *moveable* address for loops etc. Lables can be added to or subtracted from on a program line by up to +/- 65535. **.LABEL+65535**, **.LABEL-65535**.

(6) DATA STORAGE
***TX "THIS IS DATA"** - The ***TX** command is for storing ASCII values in memory sequentially.

***DA $FF, 201, 65535, $98, $4000** - The ***DA** command stores numbers of maximum size 65535 ($FFFF) in memory sequentially. Numbers greater than $FF (255) are stored in lo/hi order in memory to comply with standard 6502 storage.

(7) REMARKS
' **; THIS IS A REMARK**' - The semi-colon designates a Remark. Remarks can be placed on a line by themselves or at least one space after an instruction on a line.

MERLIN ERROR MESSAGES

(1) NO COMPILE ADDRESS
The **COM** command is not on the first program line, or missing from the program altogether.

(2) LINE:xxxxx ;ILLEGAL INDIRECT
At line xxxxx you have used the wrong type of memory i.e. JMP ($DD) or LDA ($4000),Y.

(3) LINE:xxxxx ;NUMBER TOO LARGE
At line xxxxx you have used a number which is too large for the command it is paired with i.e. LDA #500.

(4) LINE:xxxxx ;SYNTAX ERROR
At line xxxxx you have typed in a command which is unrecognizeable to the assembler e.g. LDZ #$00.

(5) LINE:xxxxx ;ILLEGAL BRANCH
At line xxxxx you have used a branch which is greater than +128 or -127.

(6) LINE:xxxxx ;LABEL NOT FOUND
At line xxxxx you have made a reference to a label which has not been defined in the listing.

(7) LINE:xxxxx ;REDEFINED LABEL
At line xxxxx you have tried to use a label which has been defined more than once elsewhere in the listing.

(8) WARNING: NO END
The is not an error but as it suggests it is a warning that you ahve not put an **END** instruction at the conclusion of the listing.

(9) WARNING: MERLIN'S RESIDENCE
This is another warning which tells you if you try to assemble over the area of memory where **MERLIN** resides ($1000-$2100).